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Action Plan in Response to Future Pandemics

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ACTION PLAN IN RESPONSE TO FUTURE PANDEMICS

by

Amber Ferris

A Thesis Submitted in Partial Fulfillment
of the Requirements for a Degree with Honors
(Animal and Veterinary Sciences)

The Honors College

University of Maine

May 2021

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ABSTRACT

Zoonotic pandemics are rare and finding cures can be difficult, especially if the disease is new to scientists. Early containment can be challenging if protocols are not in place to help limit the spread. The SARS-CoV-2 (COVID-19) pandemic hit suddenly, and the number of cases grew dramatically over a short period of time. The escalation of the disease outpaced the ability of many businesses and institutions to implement protocols to keep their practice safe while remaining open.

This project researched the effect COVID-19 had on small animal veterinary practices. In order to answer the research question, “*How has COVID-19 affected small animal veterinary practices in Maine?*” a survey (approved by the University of Maine Institutional Review Board) was used to ask practitioners how COVID-19 affected daily operations, customer relations and long-term operations. Participants were asked about the protocols they implemented as a result of this pandemic. The goal was to obtain information on what worked well, what did not work well, and what lessons were learned.

This University of Maine Institutional Review Board (IRB)-approved survey was created using Qualtrics. It was emailed to 94 veterinary practices across the state of Maine (3 bounced back and 5 failed) Of the 86 practices contacted, 13 practices responded to the anonymous survey resulting in a 15% participation rate. The participants reported, to varying degrees, having to reduce hours of operation, working with a limited staff and struggling to get supplies. In regards to the implementation of safety measures they reported using curbside services, contactless payment processes, wearing masks, six-

foot distancing and making modifications to work spaces. They reported that their negative economic impact from COVID-19 was a result of losing clients, limited hours of operation, and having to increase prices to cover costs. Six of the thirteen practices responding to the income impact question reported an income shortage compared to other years, and three of these six reported having to increase prices to make up for the difference.

Understanding how COVID impacted these practices could help inform a best-practices plan to provide guidelines for practitioners to implement if another pandemic outbreak were to occur. It is presumed that many of these best practices would be effective in responding to other zoonotic or human-human disease transmission events, and the guidelines could be implemented in other, smaller-scale scenarios.

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BACKGROUND

While the events of the ongoing SARS-CoV-2 (COVID-19) pandemic are too recent to have been thoroughly studied, the American Veterinary Medical Association (AVMA) has investigated veterinary practices on a national scale. However, to our knowledge, a regional survey for Maine and surrounding states has not been completed. People, in all types of businesses, were not prepared to handle a new global pandemic, nor the due to the rapid rise of COVID-19 cases. Veterinary practices needed to act fast to figure out a way to ensure the safety of their clients and employees without shutting down.

Coronaviruses cause diseases in many animals and in people, and as a general group of viruses have been well-studied in the past. Many variations of coronaviruses have developed over the years. SARS-CoV-2, otherwise known as COVID-19, is a new coronavirus disease that has recently been discovered. There have been concerns that this new strain of coronavirus can transmit from companion animals to owners or veterinary professionals that work with these animals. Because COVID-19 hit during the Spring of 2020, there hasn't been much research on how Maine veterinary practices changed their services. The state of Maine has had lower case numbers of COVID-19 in people compared to states with higher populations, which can lead to people feeling it is not necessary to comply with the standards and guidelines put into place. The U.S. Department of Health & Human Services (HHS) and Centers for Disease Control and Prevention (CDC) came together to release guidelines for veterinary practices. These guidelines included: postponing non-urgent veterinary visits, advising vet clinic staff who

are sick to stay home, using personal protective equipment, properly cleaning and sanitizing the building, and what to do in case of an COVID-19 exposure².

Pennsylvania released a report in June 2020 stating what their veterinary hospitals were doing. The state followed the AVMA's guidelines. Non-essential, routine or elective surgical procedures could only take place in counties that were yellow (aggressive mitigation, based on case load) and green (no aggressive mitigation).⁴

Figure 1:

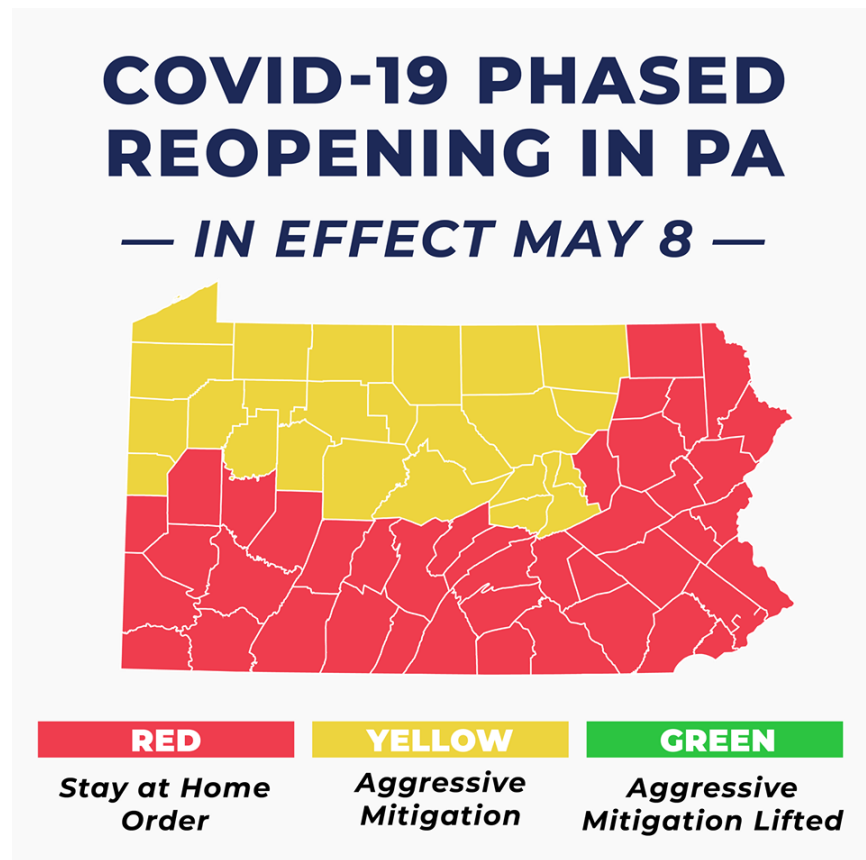


Figure 1: County colors and descriptions for COVID-19 Phased Reopening in PA for May 8, 2020. ⁵

First round vaccines for puppies and kittens could be administered in these yellow or green counties, as well as important large animal vaccines such as those protecting

against West Nile Virus.⁴ Even though the CDC released guidelines for veterinary hospitals to follow, and the state of Pennsylvania had a plan as of March 2020, here in Maine veterinarians were allowed to continue to operate, leaving it up to the owners to decide how to run their practices. Governor Mills' pronouncement in March of 2020⁵ suggested vet offices to ask clients about travel and their potential contact/exposure to COVID-19 cases, and if they had experienced any COVID-19 symptoms in the past 14 days prior to their visit.³

The AVMA did a survey in early spring of 2020 regarding the changes that veterinary offices nationwide put into place. Veterinarians nationwide were cutting back on wellness, vaccine and examination appointments for animals unless it was an emergency. The AVMA's survey showed that over 30% of veterinary practices were using telemedicine and close to 20% of practices were only seeing emergency related cases.¹ Due to reducing appointments, veterinary practices also experienced a cash shortfall. The average monthly cash shortfall across all practices who participated in the survey was \$17,000 in April 2020 and the AVMA projected the cash shortfall per practice to increase to \$23,000 in May 2020.¹ With the nation experiencing a large impact on personal income, it can be assumed that Maine veterinarians would be struggling as well.

The AVMA's survey focused on veterinary hospitals of all types including small animal, large animal and exotic animal hospitals across the United States. Since Maine is a state that faces seasonal weather extremes and many tourists, most practices operate differently under normal conditions than other states. This means that the guidelines the CDC put into place for other states to follow may not have worked as well for practices

in New England. For this reason, the survey in this project focused specifically on small animal practices in the state of Maine.

Goal of Project

The goal of this project was to obtain data about the impacts of the COVID-19 pandemic on small animal veterinary practices in Maine. Specifically, this project investigated which protocols were successful, which were unsuccessful, and what lessons were learned regarding day-to-day and long-term operations.

Purpose of Project

This purpose of this project was to research the effect of SARS-CoV-2 (COVID-19) on small animal veterinary hospitals and clinics in the state of Maine in 2020.

Significance of Project

Maine veterinary practices were asked what protocols they have put into place as a result of this pandemic. The data collected, as a result of this research, could be used to create a potential best-practices plan, including guidelines and recommendations, for practitioners and facilities in the event another pandemic outbreak were to occur.

HYPOTHESIS

The proposed research question explored how veterinary practices could operate in the most efficient and effective way, while also keeping their employees and clients safe. The project looked at how COVID-19 has affected veterinary practices in Maine and what changes were implemented in order to keep practices functioning safely. I hypothesized that practices following CDC guidelines such as allowing staff and clients the ability to social distance while still providing effective and efficient care would have lower economic losses during the COVID-19 pandemic.

METHODS

University of Maine Institutional Review Board (IRB) training was required since this research used people as a source of information. The project proposal and questions were submitted in an application to the IRB for approval. Using a University of Maine Institutional Review Board (IRB, #2020-11-11) approved on-line survey that was created using Qualtrics, information was obtained from small animal veterinarians in Maine on the effect that COVID-19 has had on their practices. The survey was distributed online with the link to the survey in an email. The answers to the survey were stored in Qualtrics until March of 2021. The survey contained questions on daily operations, how staff interacted with clients, long and short-term operation changes, financial stability and “lessons learned” that could be integrated into future infectious disease emergency plans. This survey was completely anonymous.

The first step of the project was to develop a research question/hypothesis to be answered. Next, survey questions were drafted to help answer the question of how COVID-19 has affected the practices in Maine (See Appendix A). This information could support the development of a plan for future pandemic outbreaks. An email listed comprised of small animal veterinary practices email addresses located using veterinary practices’ public websites was created. As well, email contacts for Maine small animal veterinary hospitals and clinics were collected from public websites, Facebook and via phone calls. These emails were placed into a document which allowed electronic distribution of the survey. The parameters used to find participants included that the practices had to work with small, companion animals (i.e., dogs, cats, rabbits, guinea

pigs.) The practices could be ambulatory, emergency or routine-visit clinics; and had to be located in the state of Maine. Participants answering the survey questions were required to be 18 years or older and had to work in the small animal clinic during the COVID-19 pandemic. The survey was sent out through a distribution email on Qualtrics. Once the survey was completed by the veterinary hospitals and clinics, the data were grouped together based on similar answers in Qualtrics. The data were summarized by question.

RESULTS

Once the survey was completed and submitted by participating veterinary practices, responses were graphically depicted using bar graphs, and conclusions were drawn based on patterns seen in these responses. (See Appendix B for individual survey responses.) A total of 106 small animal practices were listed as possible participants for this project. Email addresses for 94 of these practices were located and the survey was emailed to these practices. Eight email messages failed. Out of the 86 messages believed to have successfully reached their destination, thirteen surveys were completed and returned for consideration of data included in the results of this project. Therefore, 15% of the possible participants of this project responded.

Figure 2:

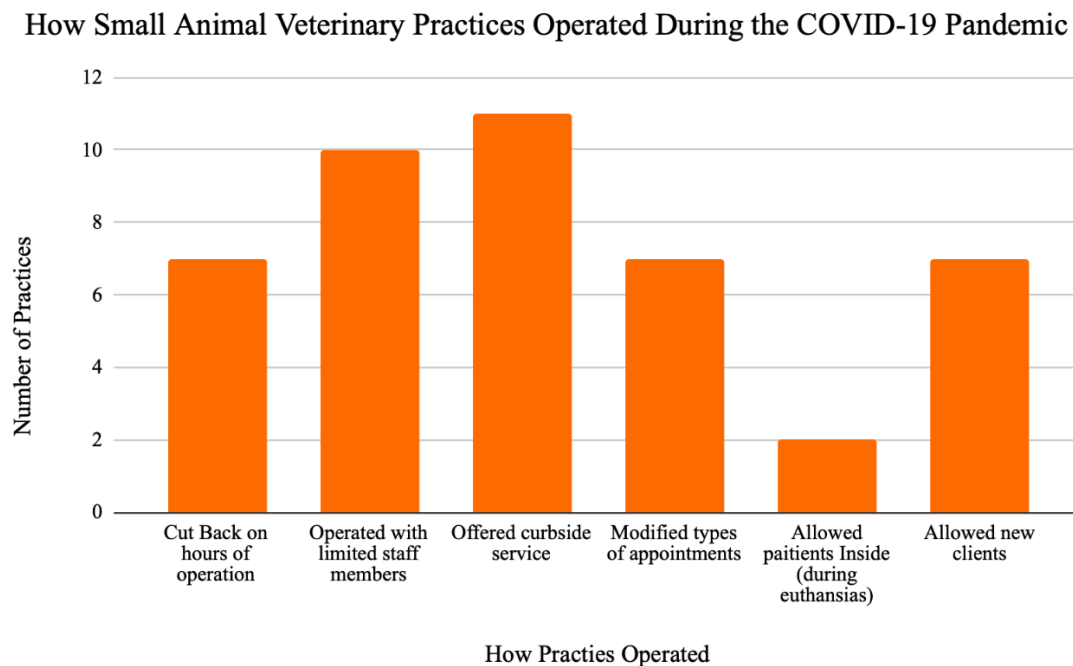


Figure 2: How small animal veterinary practices in Maine operated during the COVID-19 pandemic from Spring 2020 – Spring 2021 (n = 13 respondents).

Figure 3:

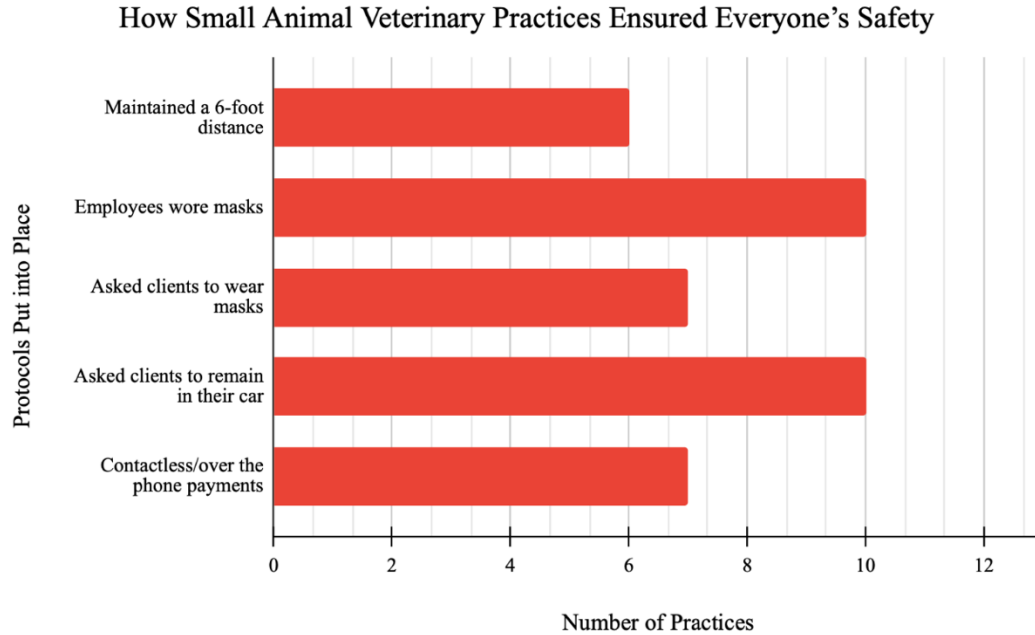


Figure 3: Protocols put into place to accommodate for staff and client's safety at small animal veterinary practices in Maine during spring 2020 – spring 2021 (n = 13 respondents)

Figure 4:

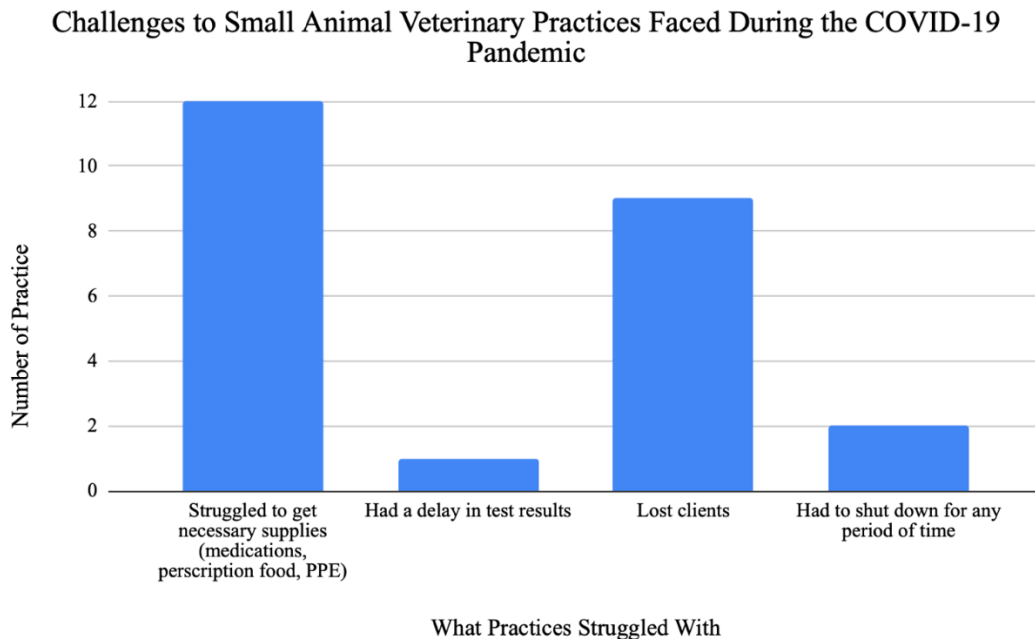


Figure 4: Areas in which small animal veterinary practices in Maine struggled during the COVID-19 pandemic from spring 2020 – spring 2021 (n = 13 respondents).

Figure 5:

The Economic Impact Small Animal Veterinary Practices Experienced During the COVID-19 Pandemic

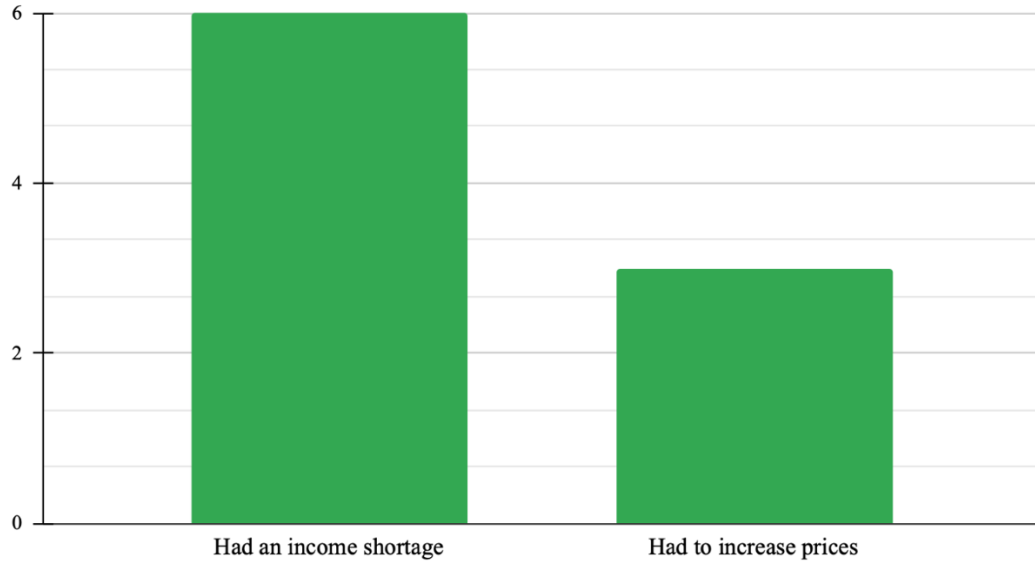


Figure 5: Self-reported economic impact that small animal veterinary practices in Maine faced due to COVID-19 from spring 2020 – spring 2021 (n = 13 respondents).

Figure 6:

Practices that had an Economic Impact Compared to Practices with no Economic Impact

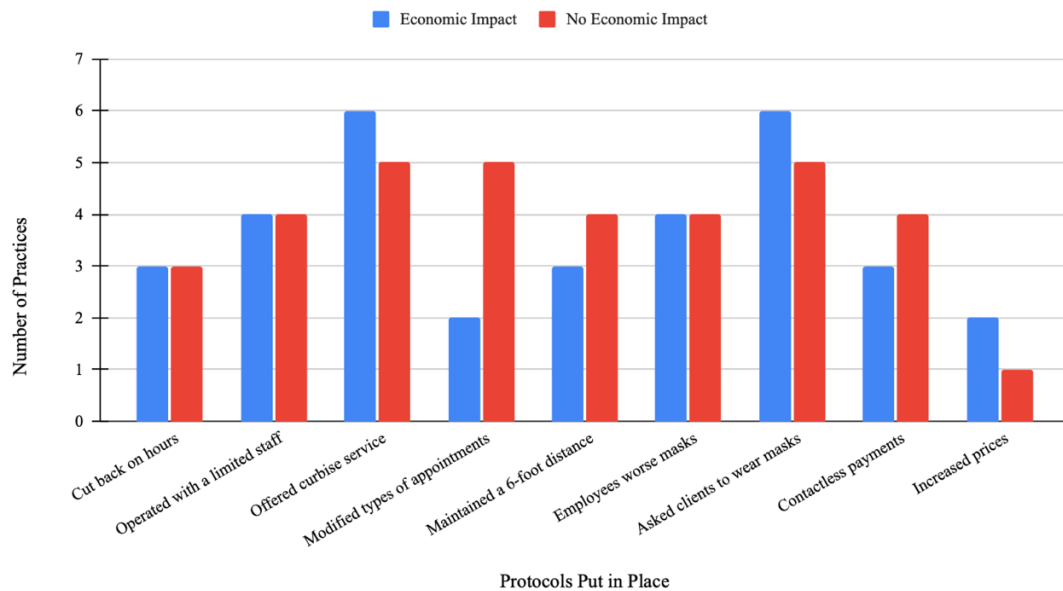


Figure 6: Comparison of protocols put into place by small animal veterinary practices that had an economic impact to practices with no economic impact from spring 2020 – spring 2021 (n = 13 respondents).

DISCUSSION

I hypothesized that practices allowing staff and clients the ability to social distance while still providing effective and efficient care would have lower economic losses during the COVID-19 pandemic. Looking at the data, cutting back on hours of operation and operating with a limited staff did not seem to have an economic impact on small animal veterinary practices. Six out of the six practices that had an economic impact did curbside service, whereas only five out of the seven that had no impact did curbside. An equal number of practices that had an economic impact to ones with no impact that followed the six-foot social distancing guideline, asked employees and clients to wear masks, and did contactless payments experienced economic losses, versus those with no losses. The major difference between the practices with losses, versus no losses was modifying types of appointments. Five out of the seven practices that experienced no impact modified types of appointments and only did routine visit, versus only two out of the six with no economic losses. Thus, even though they potentially saw fewer patients in a day, practices that modified appointments and only did routine visits didn't lose any more by making this choice. Overall, the data does not support that practices using social distancing and following other CDC guidelines were able to operate with no economic impact. There were fewer practices that followed these guidelines with versus those with an economic impact. In conclusion, practices that didn't follow CDC guidelines as strictly had no economic impact whereas practices that did follow the guidelines, did experience an economic impact.

Speculation from Trends

The COVID-19 pandemic will continue to affect small animal veterinary practices across Maine for some time in regards to their economic standing. Due to practices having to operate with a limited staff and shorter hours of operations, fewer clients are seen on a daily basis during the COVID-19 pandemic than during normal conditions. Six out of the thirteen respondents recorded they had a decrease in income. To try and accommodate for the loss in income, 3 practices increased their prices of visits, medications, and food.

Some of the protocols that have been put in place will continue after the pandemic ends (i.e. curbside services, contactless payment).

Comparison of Results to Previous Studies

At this time (2021), the COVID-19 pandemic is too recent to have been thoroughly studied. However, some results of this project are consistent with previous studies. In 2020, the AVMA reported concern about the new strain of coronavirus spreading to companion animals and infecting pet owners. Our project noted that 4 of the 11 practices reported owners being concerned that their pets would get COVID-19. However, our study did not obtain further information as to whether the owners were concerned, that they in turn, could get COVID-19 from their pets.

The AVMA reported in 2020 that veterinary practices needed to act to ensure the safety of clients and employees in order to avoid closing. In this project only two of the 13 respondents having to close (see figure 3). This project is also consistent with the

previous work of the AVMA in regards to veterinary practices cutting back on non-emergency visits. Seven of the thirteen practices in this project reported modifying the type of visits they were providing for their clients (see figure 2).

Recommendation for Future Direction for This Work

Although this was a small study, it's of interest to know that veterinary practices in Maine responded to the COVID-19 pandemic with protective measures to allow operations to continue without shutting down. However, this type of project could help give direction to future studies on the impact of a pandemic on small animal veterinary practices in the state of Maine. This type of project would be very beneficial to the development of a best-practices plan that could serve as guidelines and recommendations for practitioners and facilities to implement if another pandemic were to occur.

Even though 106 small animal practices were found in the state of Maine, only 94 of them had email addresses. Out of those 94, 86 emails were actually delivered and there was only a 15% response rate. Using websites and Facebook to collect emails was not the most efficient and effective way. Sending the survey over email also was not very productive. Since many veterinary practices do not update their websites or Facebook pages, eight emails were known to have failed, and of the remaining ones that were delivered, it is unknown if the emails actually reached the intended recipients. Finding other ways to distribute the survey may lead to higher response rate.

INFROMATION DISSEMINATION

I will share the results of my project during a project presentation on April 1, 2021 and May 3, 2021. I will also submit a final draft report of my project as partial fulfillment of the requirements for a Degree with Honors.

BIBLIOGRAPHY

1. American Veterinary Medical Association. "COVID-19 Impact on Veterinary Practices." *American Veterinary Medical Association*, 2020, www.avma.org/resources-tools/animal-health-and-welfare/covid-19/covid-19-impact-veterinary-practices
2. U.S. Department of Health & Human Services. "Interim Infection Prevention and Control Guidance for Veterinary Clinics Treating Companion Animals During the COVID-19 Response." *Centers for Disease Control and Prevention*, Centers for Disease Control and Prevention, 12 Aug. 2020, www.cdc.gov/coronavirus/2019-ncov/community/veterinarians.html.
3. Soverel, Katherine. "Guidance on COVID-19." *Maine Veterinary Medical Association*, Maine Veterinary Medical Association, 6 Apr. 2020, www.mainevetmed.org/guidance-on-covid-19
4. Pennsylvania Department of Health. "Guidance on Veterinary Practice amid COVID-19 Pandemic." *Pennsylvania Department of Agriculture*, 24 June 2020, www.agriculture.pa.gov/Documents/Veterinary%20Guidance.pdf
5. Writer, JEFF HAWKES | Staff. "Gov. Wolf: Lancaster County Not among 24 Counties to Partially Reopen Friday, May 8." *LancasterOnline*, LNP Media Group, Inc., 1 May 2020, lancasteronline.com/news/local/gov-wolf-lancaster-county-not-among-24-counties-to-partially-reopen-friday-may-8/article_f5c4a084-8bc1-11ea-9919-03025d700a4f.html.

APPENDICES

APPENDIX A UNIVERSITY OF MAINE INSTITUTIONAL REVIEW BOARD
APPLICATION

APPLICATION COVER PAGE

- **KEEP THIS PAGE AS ONE PAGE – DO NOT CHANGE MARGINS/FONTS!!!!!!!!!!**
- **PLEASE SUBMIT THIS PAGE AS WORD DOCUMENT**

APPLICATION FOR APPROVAL OF RESEARCH WITH HUMAN SUBJECTS
Protection of Human Subjects Review Board, 400 Corbett Hall

(Type inside gray areas)

PRINCIPAL INVESTIGATOR: Amber Ferris

EMAIL: amber.ferris@maine.edu

CO-INVESTIGATOR: Anne Lichtenwalner

EMAIL:

anne.lichtenwalner@maine.edu

CO-INVESTIGATOR: Sue Ishaq

EMAIL: sue.ishaq@maine.edu

FACULTY SPONSOR: Anne Lichtenwalner, Sue Ishaq

EMAIL:

anne.lichtenwalner@maine.edu, sue.ishaq@maine.edu

(Required if PI is a student):

TITLE OF PROJECT: Action Plan for Veterinarians in Response to Future Pandemics

START DATE: December 1, 2020 or upon IRB approval

PI DEPARTMENT: School of

Food and Agriculture: AVS

STATUS OF PI: FACULTY/STAFF/GRADUATE/UNDERGRADUATE U (F,S,G,U)

If PI is a student, is this research to be performed:

☒

for an honors thesis/senior thesis/capstone?

☐

for a master's thesis?

☐

for a doctoral dissertation?

☐

for a course project?

☐

other (specify)

Submitting the application indicates the principal investigator's agreement to abide by the responsibilities outlined in Section I.E. of the Policies and Procedures for the Protection of Human Subjects.

Faculty Sponsors are responsible for oversight of research conducted by their students. The Faculty Sponsor ensures that he/she has read the application and that the conduct of such research will be in accordance with the University of Maine's Policies and Procedures for the Protection of Human Subjects of Research. REMINDER: if the principal investigator is an undergraduate student, the Faculty Sponsor MUST submit the application to the IRB.

Email this cover page and complete application to UMRIC@maine.edu

FOR IRB USE ONLY **Application #**
Category:
ACTION TAKEN:

Review (F/E):

Expedited

- | | | | |
|--------------------------|--|--------------------------------|------------------------|
| <input type="checkbox"/> | Judged Exempt; category | Modifications required? | Accepted (date) |
| <input type="checkbox"/> | Approved as submitted. Date of next review: by | Degree of Risk: | |
| <input type="checkbox"/> | Approved pending modifications. Date of next review: by | Degree of Risk: | |
| | Modifications accepted (date): | | |
| <input type="checkbox"/> | Not approved (see attached statement) | | |
| <input type="checkbox"/> | Judged not research with human subjects | | |

FINAL APPROVAL TO BEGIN

Date

10/2018

Title: Action Plan in Response to Future Pandemics

PRINCIPAL INVESTIGATOR: Amber Ferris
amber.ferris@maine.edu

EMAIL:

FACULTY SPONSORS: Anne Lichtenwalner, Sue Ishaq
anne.lichtenwalner@maine.edu, sue.ishaq@maine.edu

EMAILS:

START DATE: December 1, 2020 or upon IRB approval

PI DEPARTMENT: School of Food and Agriculture: AVS

STATUS OF PI: UNDERGRADUATE

If PI is a student, is this research to be performed: Honors Thesis/ Senior Capstone

Funding: N/A

Summary

Zoonotic pandemics are rare and finding cures or vaccines can be difficult, especially if the disease is fairly new to scientists. Early containment of the disease can be difficult if protocols are not already in place to help deal with the spread of the disease. The SARS-CoV-2 pandemic came on suddenly and the number of cases grew dramatically over a small period of time. The escalation of the disease outpaced the ability of small businesses and institutions to implement safety protocols to keep their practice safe while being open.

This project will research the effect that SARS-CoV-2 (COVID-19) has had on small animal veterinary hospitals and clinics in the state of Maine in 2020. While the events of the COVID-19 pandemic are too recent to have been thoroughly studied, the American Veterinary Medical Association (AVMA) investigated practices on a national scale. However, a regional survey for Maine has not been done, to my knowledge. A survey (approved by the UM Institutional Review Board) will be used to ask practitioners how COVID-19 has affected their daily operations, customer relations, long-term operations, and what emergency plans they have put into place.

The goal is to obtain information on what emergency plans worked well, what did not work well, and lessons learned during this pandemic. Understanding how COVID has

impacted these practices in Maine will help to create a potential best-practices plan that will serve as guidelines and recommendations for practitioners and facilities to implement if another pandemic outbreak were to occur. It is presumed that many of these best practices are also effective in reducing other zoonotic or human-human disease transmission, and the guidelines may be implemented in other, smaller-scale control scenarios.

References:

1. American Veterinary Medical Association. "COVID-19 Impact on Veterinary Practices." *American Veterinary Medical Association*, 2020, www.avma.org/resources-tools/animal-health-and-welfare/covid-19/covid-19-impact-veterinary-practices.
2. U.S. Department of Health & Human Services. "Interim Infection Prevention and Control Guidance for Veterinary Clinics Treating Companion Animals During the COVID-19 Response." *Centers for Disease Control and Prevention*, Centers for Disease Control and Prevention, 12 Aug. 2020, www.cdc.gov/coronavirus/2019-ncov/community/veterinarians.html.
3. Soverel, Katherine. "Guidance on COVID-19." *Maine Veterinary Medical Association*, Maine Veterinary Medical Association, 6 Apr. 2020, www.mainevetmed.org/guidance-on-covid-19.

Methods

Using a University of Maine IRB-approved survey that will be created online using Qualtrics, information from veterinarians in Maine on the effect that COVID-19 has had on their practices will be obtained. The survey will contain questions on daily operations, how staff interact with clients, long and short-term operation changes, financial stability and lessons learned that will be integrated into the future plans for infectious-disease emergency plans. The survey will be completely anonymous. This information will lead to developing a plan for future pandemic outbreaks. A list of contacts to most of the small animal practices in Maine was created. These offices will be contacted by phone or email about participating in this survey. Once IRB training and approval from the University of Maine IRB is complete, the data collection process will be started by emailing the survey to all practices who agreed to participate in the survey.

Personnel

My name is Amber Ferris, I am an undergraduate student majoring in Animal and Veterinary Science with a concentration in Pre-Vet, with a minor in Equine Studies in the College of Natural Sciences, Forestry, and Agriculture and I'm a student in the Honors College. I have completed the CITI IRB training along with faculty sponsors Dr. Anne Lichtenwalner and Dr. Sue Ishaq. This will be the students' first-time conducting research involving surveys of human subjects.

Dr. Lichtenwalner is tenured faculty in the School of Food and Agriculture at the University of Maine, with 10 years of experience investigating infectious diseases transmissible between wildlife and livestock. She has mentored many undergraduate students in research involving surveys of human subjects within these 10 years.

Dr. Sue Ishaq is an Assistant Professor of Animal and Veterinary Studies at the University of Maine in the School of Food and Agriculture. She has 10 years and counting of animal science research, primarily focused on host-associated microbiota and host health, and several years of experience mentoring undergraduates and graduate students in research. Dr. Ishaq will provide guidance on generation of research design and documents, including these regulatory documents, and will aid in ensuring data storage and privacy protection.

Participant Recruitment

Participants must be 18 years or older, and must currently own or be employed by a small animal veterinary practice. The survey will be disseminated using Qualtrics, and links to the survey will be shared by email using a compiled list of active practices which fall under the following parameters:

- Work with small animals (i.e., dogs, cats, rabbits, hamsters.)
- Can be an emergency practice
- Practice is located in Maine

Emails were collected via online websites or over the phone. Contact information is publicly available.

100 small animal veterinary hospitals and clinics will be contacted. A rate of 50% participation is expected.

Informed Consent

The informed consent will be presented before the survey questions on the first page. The participants will read the consent and agree to its terms before moving on the survey questions. (Refer to Appendix B)

Confidentiality

All participants will remain anonymous during the survey. The survey will be created on Qualtrics with all responses being saved on a password protected hard drive accessed by the primary investigator and the faculty sponsor. Data will be saved and utilized indefinitely. Once analyses of the answers retrieved from the survey is completed in March 2021, the data will be deleted off of Qualtrics.

Risks to Participants

There is no risk associated with taking this survey besides the time commitment. The survey may also cause some inconvenience and delay in other work. At any time, participants are free to exit the survey if they do not wish to continue.

Benefits

There are no direct benefits, however, participation helps researchers gather data to gain a better understanding of how the COVID-19 pandemic affected small animal veterinary practices. Knowing more about how COVID-19 affected small animal veterinary practices helps with dealing/working with possible pandemics in the future

Compensation: N/A

Appendices

Appendix A: Survey Questions

Appendix B: Informed Consent

Appendix C: Recruitment Text

Appendix A **Survey**

Daily Operations:

- Has your practice had to cut back on its normal hours of operation?
 - Yes: _____
 - No: _____
- Have you had to run with a limited staff?
 - Yes: _____
 - If yes, how many people were you allowing in your building at once? _____
 - No: _____
- Did you struggle with getting any supplies (i.e. food/products/equipment/meds to fill prescriptions)?
 - Yes: _____
 - If yes, which products? _____
 - No: _____
- Was there a delay with any kind of test results?
 - Yes: _____
 - No: _____
- Did you do curbside service?
 - Yes: _____
 - No: _____
- Did you stop doing different types of appointments for a while or only do a certain kind (i.e. emergencies, wellness exams, or booster shots)?
 - Yes: _____
 - If yes, what type of appointments did you do? _____
 - No: _____

Customer Relations:

- Have you been allowing patient owners to enter your building?
 - Yes: _____
 - If so, under what circumstances? _____
 - No: _____
- How did you ensure the safety of customers? (select all that apply)
 - A. I maintain a 6-foot distance
 - B. Employees wore masks
 - C. Asked clients to wear masks
 - D. Asked clients to remain in their cars
 - E. Contactless payment (over the phone)
- How did you keep customers involved in the appointment? (select all that apply)

- A. Doctors or Techs met with owners before and after appointment
- B. Called Owners on the phone during appointment
- C. Wrote out summaries of appointment
- Did your clients seem more worried about their pets during this time?
 - Yes: _____
 - No: _____
- Were your clients worried about their pets getting COVID?
 - Yes: _____
 - No: _____

Long Term Operations

- Did you lose any clients due to how your practice operated during COVID-19?
 - Yes: _____
 - No: _____
- Did you allow any new clients?
 - Yes: _____
 - No: _____
- Did you have to shut down your practice for any period of time?
 - Yes: _____
 - If so, when and for how long? _____
 - No: _____
- Was there an income shortage during the months of COVID?
 - Yes: _____
 - No: _____
- Did you have to increase your prices of different services?
 - Yes: _____
 - No: _____
- Is this cost increase reflective of a change in your base costs of ____? (select all that apply)
 - A. Equipment
 - B. Medicine or supplies
 - C. Labor costs

Emergency Plans:

- Did you maintain 6ft social distancing?
 - If yes, what did you do to encourage or maintain that? _____
 - If no, did you take other precautions? _____
- Did you ask your staff and clients to wear masks at all times?
 - Yes: _____
 - No: _____
 - If no, when did you enforce the masks? _____
- What were your protocols if an employee came up sick? _____
- Did you ask clients questions concerning ____ before their appointments? (select all that apply)
 - A. Travel within the past 2 weeks
 - B. Illness in the past 7 days

- C. Been tested for COVID and the results of that test
- What were your protocols if clients were sick, positive for COVID, or tested and pending results? _____
- Were you aware of the CDC guidelines?
 - If yes, which aspects of those guidelines did you follow? _____
 - If no, what were some things you did differently? _____
- Which guidelines that you put into place worked best for you? _____
- Which guidelines did not work well for you and will need future planning? _____

Appendix B: Informed Consent

My name is Amber Ferris, I am an undergraduate student in the College of Natural Sciences, Forestry, and Agriculture at the University of Maine. I am researching how COVID-19 pandemic affected small animal veterinary practices. I am working alongside faculty sponsors Drs. Anne Lichtenwalner and Sue Ishaq. Dr. Lichtenwalner is the Associate Professor of Animal and Veterinary Sciences, Extension Veterinarian / Director of the University of Maine Veterinary Diagnostic Laboratory. Dr. Sue Ishaq is an Assistant of Animal and Veterinary Studies in the School of Food and Agriculture at the University of Maine. You must own currently or have possible connections to small animal veterinary practices, and you must be 18 years or older to participate.

The purpose of this survey is to obtain information on how COVID-19 has affected small animal veterinary practices in the State of Maine. The goal is to collect data on emergency plans put into place that can help other veterinary clinics. This survey has the potential to help develop safety procedures to be prepared for a possible pandemic. You must be at least 18 years old to participate. You also must have experience working in a veterinary clinic during the COVID-19 pandemic.

What will you be asked to do?

If you wish to participate you will be asked to complete an anonymous survey that may take 15-20 minutes to complete. The questions cover topics such as your daily operations, customer relations, long-term operations, and what emergency plans were put into place. Depending on your response to certain questions, the survey may skip over questions that do not pertain to you.

Risks

There is no risk associated with taking this survey besides the time commitment. The survey may also cause some inconvenience and delay in other work. At any time, you are free to exit the survey if you do not wish to continue.

Benefits

There are no direct benefits, however, participation helps researchers gather data to gain a better understanding of how the COVID-19 pandemic affected small animal veterinary practices. Knowing more about how COVID-19 affected small animal veterinary practices helps with dealing/working with possible pandemics in the future.

Confidentiality

This survey is anonymous. No personal information is required to complete the survey. The survey will be created on Qualtrics with all responses being saved on a password protected hard drive accessed by the primary investigator and the faculty sponsor. This project data will be kept indefinitely.

Voluntary

This survey is voluntary and questions can be skipped.

Contact Information

If you have any questions, please contact Amber Ferris at amber.ferris@maine.edu, Dr. Anne Lichtenwalner at anne.lichtenwalner@maine.edu, or Dr. Sue Ishaq at sue.ishaq@maine.edu. If you have any questions regarding your rights as a participant within this study, feel free to contact the Office of Research Compliance at umric@maine.edu.

Appendix C: Recruitment Text**Email/letter recruitment**

My name is Amber Ferris and I am a researcher at the University of Maine, working with Drs. Anne Lichtenwalner and Sue Ishaq. I retrieved your contact information from your online website. I am conducting a research study about how the SARS-CoV-2 (COVID-19) pandemic affected small animal veterinary practices and what aspects they needed to change to adapt to the CDC's guidelines. I am contacting you to ask if you would be willing to participate. Participation would involve an anonymous survey that will take approximately 20 minutes to complete that will ask you about your experience and how you responded to the COVID-19 pandemic. You must be at least 18 years old to participate. You also must have experience working in a veterinary clinic during the COVID-19 pandemic.

This survey and consent form can be accessed by this link: (Link to be added after survey is made).

If you have any questions, please contact me.

Thank you for your time.

Amber Ferris

Contact information:
amber.ferris@maine.edu

APPENDIX B SURVEY QUESTIONS AND RESULTS

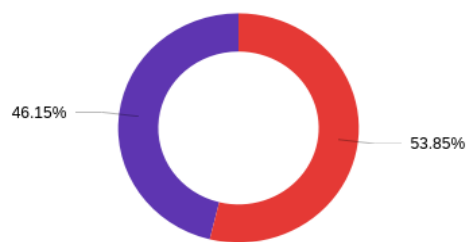
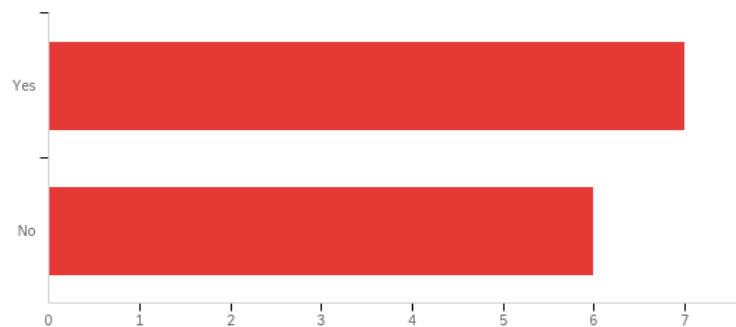
Default Report

Action Plan in Response to Future Pandemics

Q1 - Has your practice had to cut back on its normal hours of operation?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Has your practice had to cut back on its normal hours of operation?	1.00	2.00	1.46	0.50	0.25	13

#	Answer	%	Count
1	Yes	53.85%	7
2	No	46.15%	6
	Total	100%	13

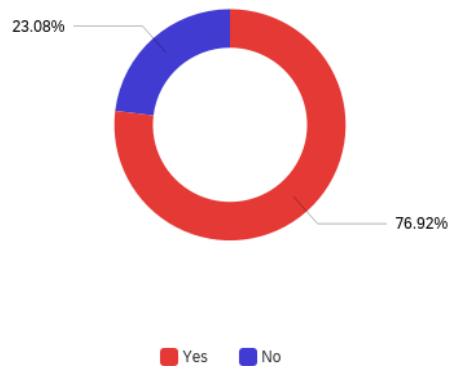
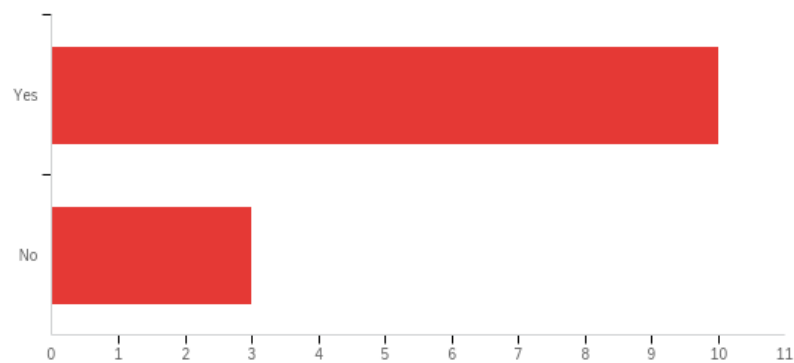


■ Yes ■ No

Q2 - Have you had to run with a limited staff?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Have you had to run with a limited staff?	1.00	2.00	1.23	0.42	0.18	13

#	Answer	%	Count
1	Yes	76.92%	10
2	No	23.08%	3
	Total	100%	13



Q2a - If yes to question 2, how many people were you allowing in your building at once?

8
15
3
Only staff allowed (4-8 people at a time) but we have had to limit staff on hand due to exposure.

0 clients allowed in building, limited staff due to other reasons related to covid.

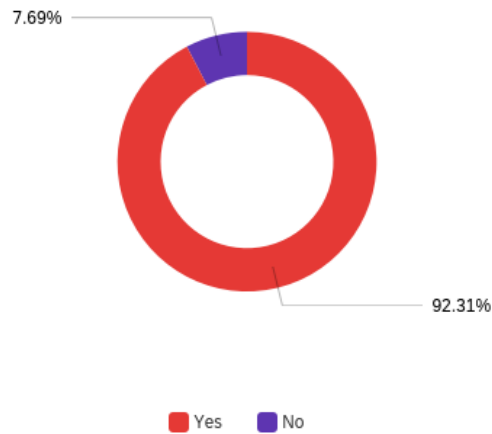
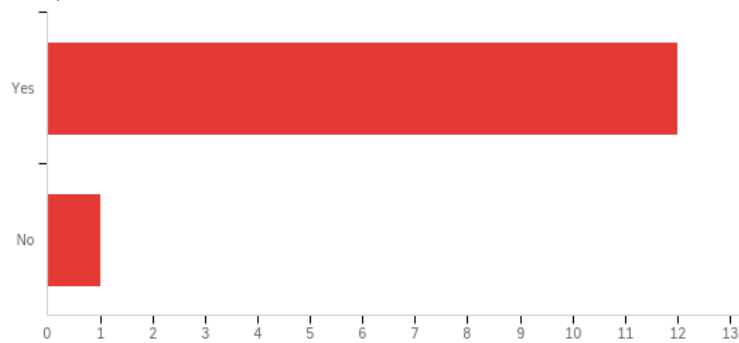
6

10 staff, 0 clients

For some time we split our team of 32 in half, we operated this way from March 27th through June 1, and then returned to full teams with about 20-22 team members in the office at one time.

No clients. Completely curbside. Only 8 staff members in the building

Q3 - Did you struggle with getting any supplies (i.e. food/products/equipment/meds to fill prescriptions)?



#	Answer	%	Count
1	Yes	92.31%	12
2	No	7.69%	1
	Total	100%	13

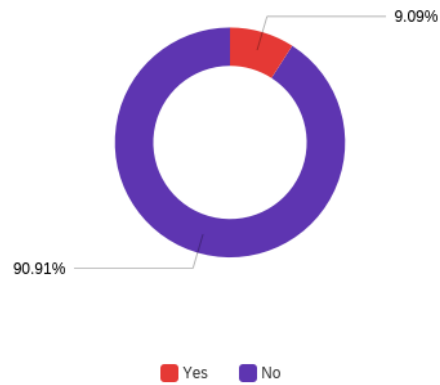
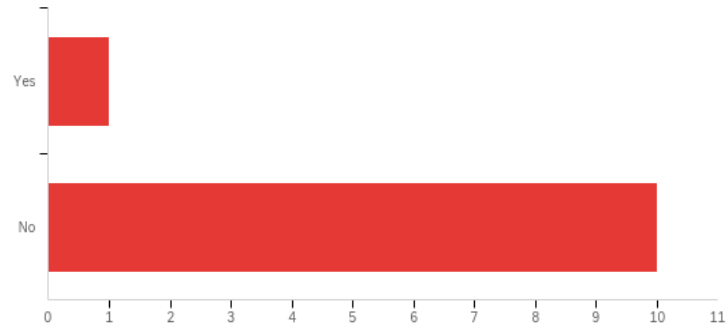
Q3a - If yes to question 3, which products?

Prescription diets
RX food, galliprant, famotidine
Pet food is back ordered like never before.
Certain medications (like prednisone), medicated shampoos with hydrocortisone, surgical gloves and masks, cleaning products - especially those containing bleach
medications and supplies, food
surgical gloves; antibiotics; anti-inflammatories
PPE
medications, hospital supplies
Mostly janitorial supplies but we've also seen disruptions and shipping delays on our prescription diets (Royal Canin specifically), and of course, PPP items such as gloves, face shields and masks.

Q4 - Was there a delay with any kind of test results?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Was there a delay with any kind of test results?	1.00	2.00	1.91	0.29	0.08	11

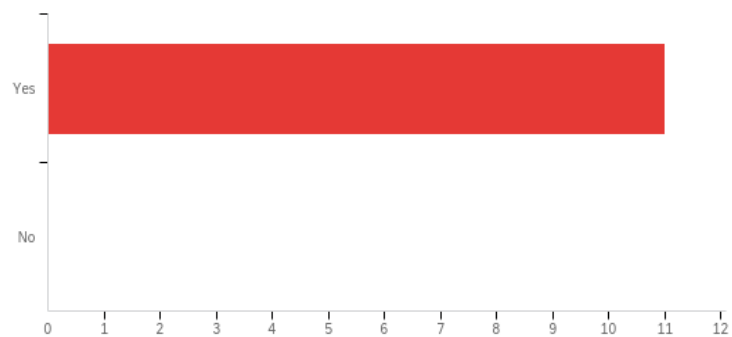
#	Answer	%	Count
1	Yes	9.09%	1
2	No	90.91%	10
	Total	100%	11

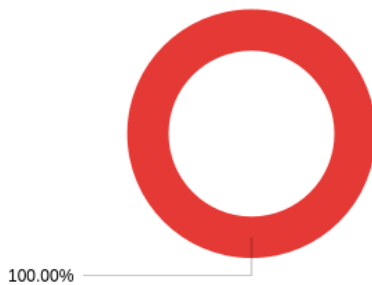


Q5 - Did you do curbside service?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Did you do curbside service?	1.00	1.00	1.00	0.00	0.00	11

#	Answer	%	Count
1	Yes	100.00%	11
2	No	0.00%	0
	Total	100%	11



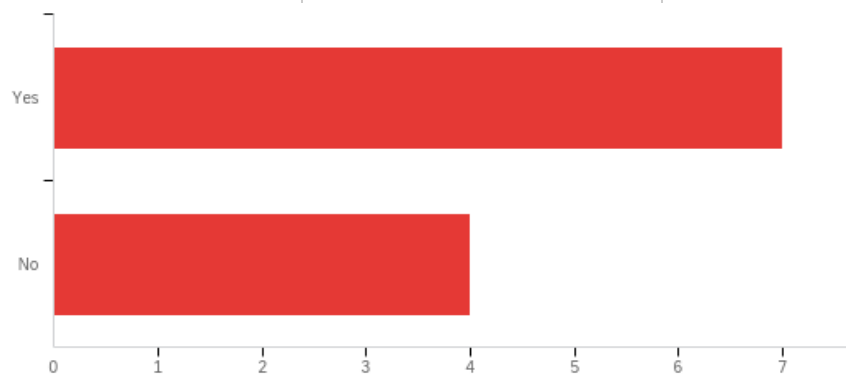


Yes No

Q6 - Did you stop doing different types of appointments for a while or only do a certain kind (i.e. emergencies, wellness exams, or booster shots)?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Did you stop doing different types of appointments for a while or only do a certain kind (i.e. emergencies, wellness exams, or booster shots)?	1.00	2.00	1.36	0.48	0.23	11

#	Answer	%	Count
1	Yes	63.64%	7
2	No	36.36%	4
	Total	100%	11





Yes No

6a - If yes to question 6, what type of appointments did you do?

sick visits only for a month or so

We stopped doing wellness appointments for a few months

Stopped seeing new clients

Sick and Emergencies Only

Emergency/urgent care only

Due to executive order, we were only able to see medically necessary appointments for some time. During this time we saw ill pets, pets that needed rabies vaccines, new puppies or kittens that needed to begin their vaccine process for overall health and of course, emergency appointments.

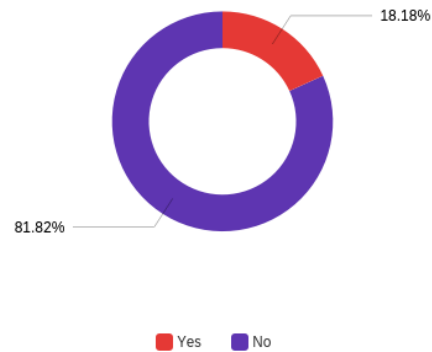
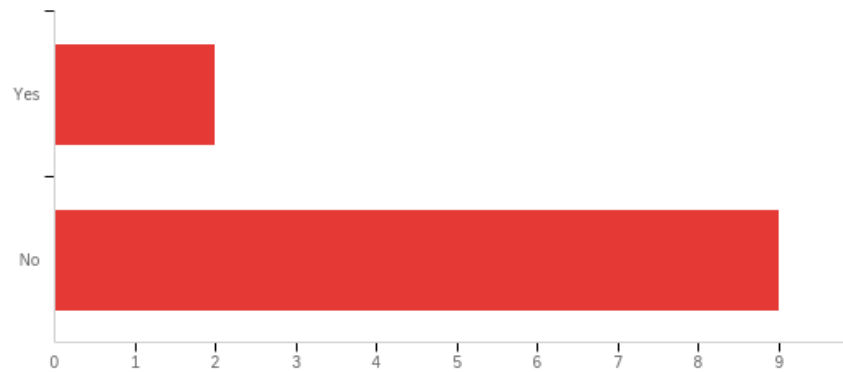
In the beginning it was only “essential” appts. Now we back to full capacity.

Q7 - Have you been allowing patient owners to enter your building?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Have you been allowing patient owners to enter your building?	1.00	3.00	2.64	0.77	0.60	11

#	Answer	%	Count
1	Yes	18.18%	2

3	No	81.82%	9
	Total	100%	11



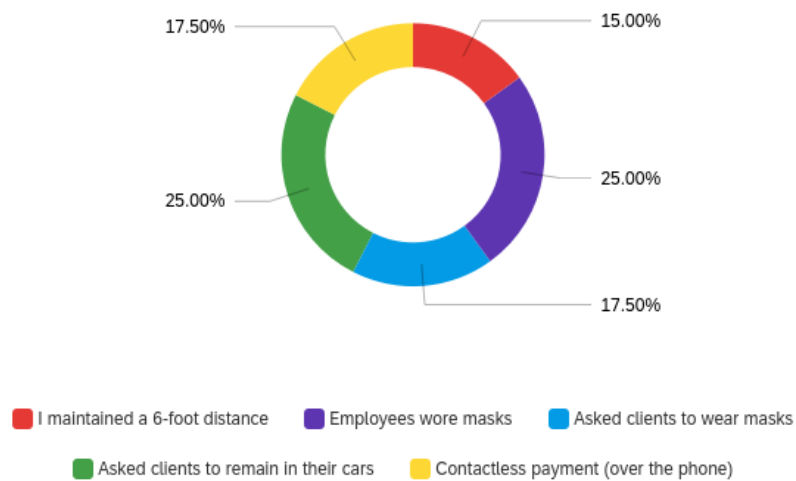
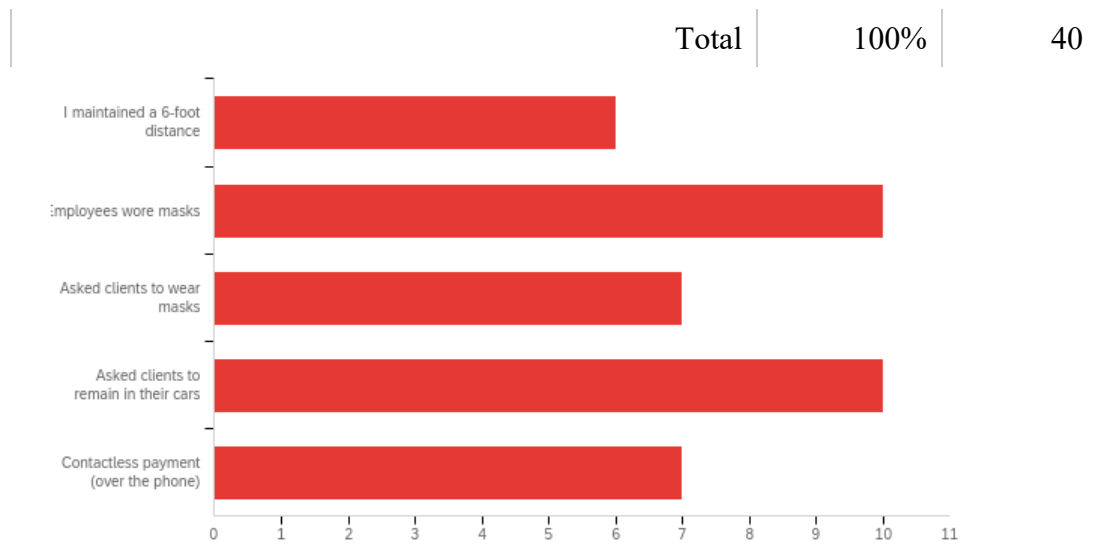
Q7a - If yes to question 12, under what circumstances?

Euthansia

Euthanasia

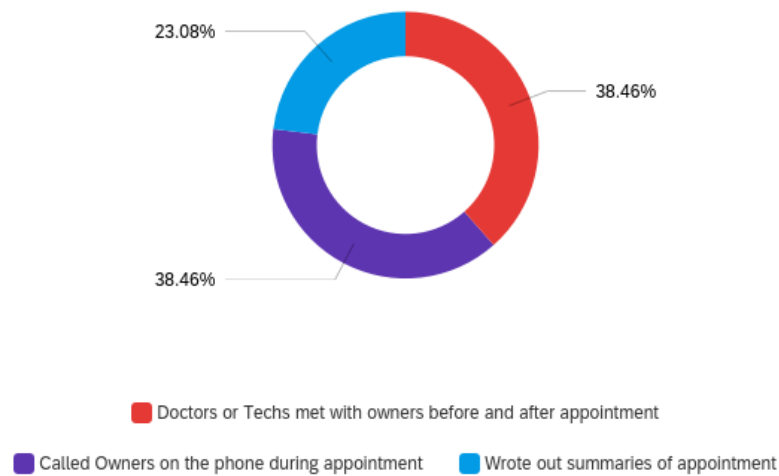
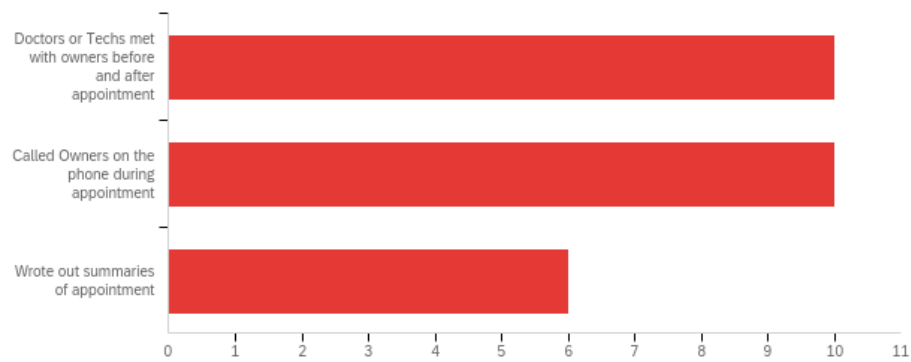
Q8 - How did you ensure the safety of customers? (select all that apply)

#	Answer	%	Count
1	I maintained a 6-foot distance	15.00%	6
2	Employees wore masks	25.00%	10
3	Asked clients to wear masks	17.50%	7
4	Asked clients to remain in their cars	25.00%	10
5	Contactless payment (over the phone)	17.50%	7



Q9 - How did you keep customers involved in the appointment? (select all that apply)

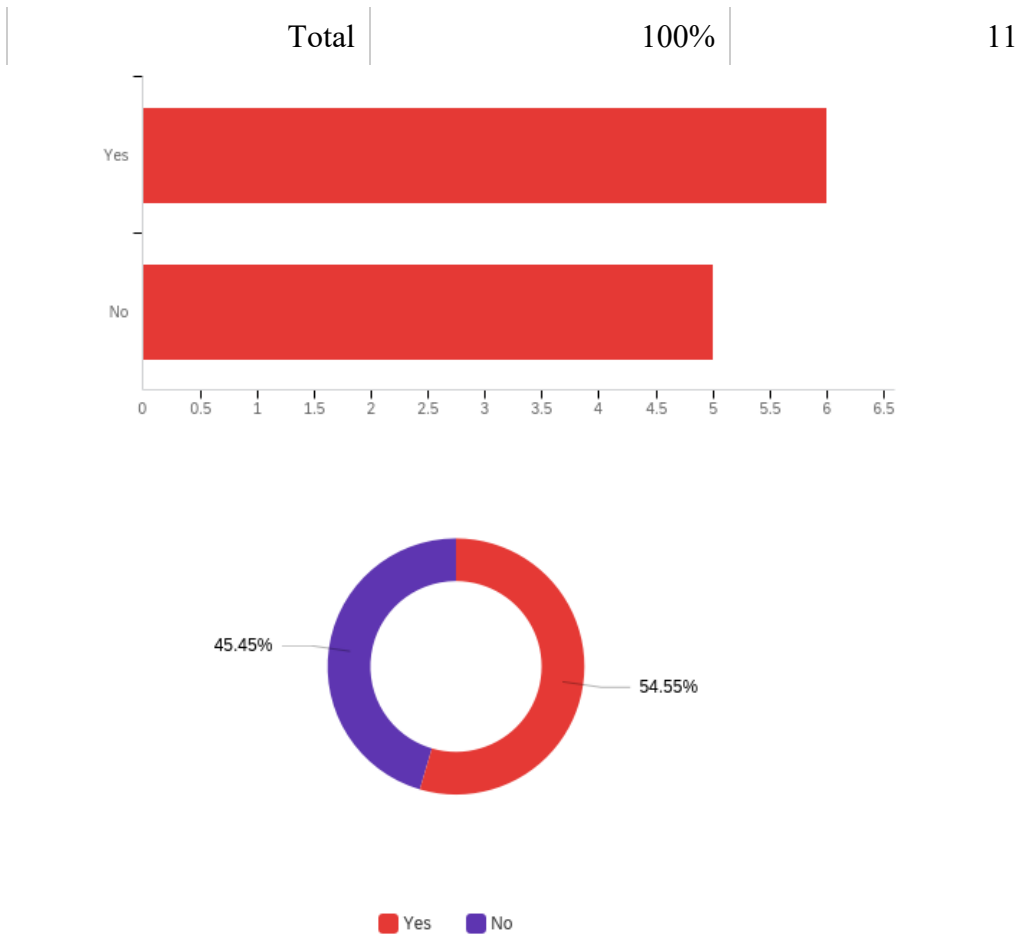
#	Answer	%	Count
1	Doctors or Techs met with owners before and after appointment	38.46%	10
2	Called Owners on the phone during appointment	38.46%	10
3	Wrote out summaries of appointment	23.08%	6
	Total	100%	26



Q10 - Did your clients seem more worried about their pets during this time?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Did your clients seem more worried about their pets during this time?	1.00	2.00	1.45	0.50	0.25	11

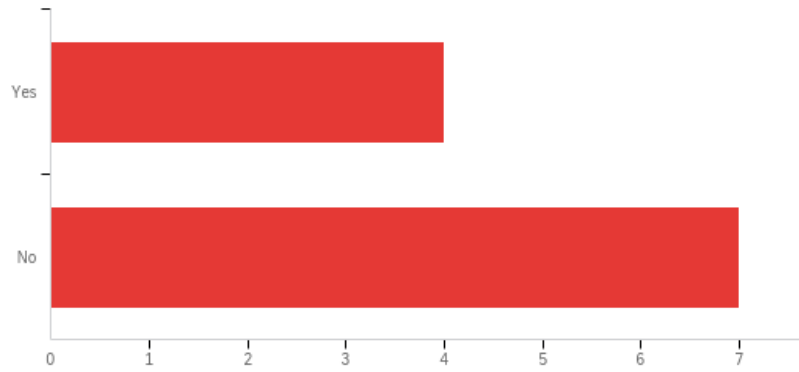
#	Answer	%	Count
1	Yes	54.55%	6
2	No	45.45%	5



Q11 - Were your clients worried about their pets getting COVID?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Were your clients worried about their pets getting COVID?	1.00	2.00	1.64	0.48	0.23	11

#	Answer	%	Count
1	Yes	36.36%	4
2	No	63.64%	7
	Total	100%	11

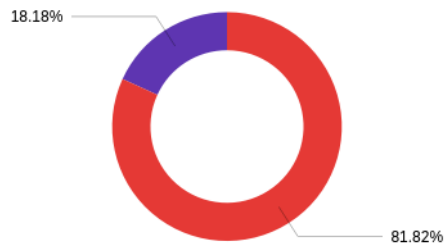
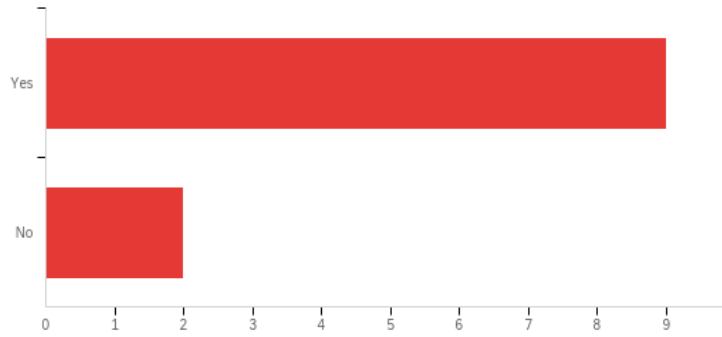


■ Yes ■ No

Q12 - Did you lose any clients due to how your practice operated during COVID-19?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Did you lose any clients due to how your practice operated during COVID-19?	1.00	2.00	1.18	0.39	0.15	11

#	Answer	%	Count
1	Yes	81.82%	9
2	No	18.18%	2
	Total	100%	11

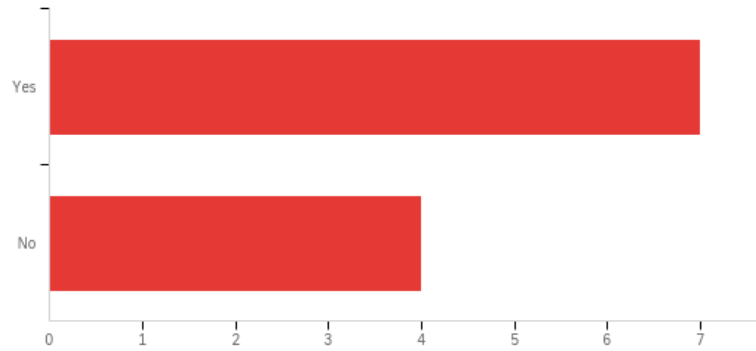


■ Yes ■ No

Q13 - Did you allow any new clients?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Did you allow any new clients?	1.00	2.00	1.36	0.48	0.23	11

#	Answer	%	Count
1	Yes	63.64%	7
2	No	36.36%	4
	Total	100%	11

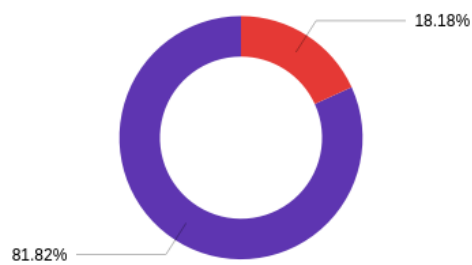
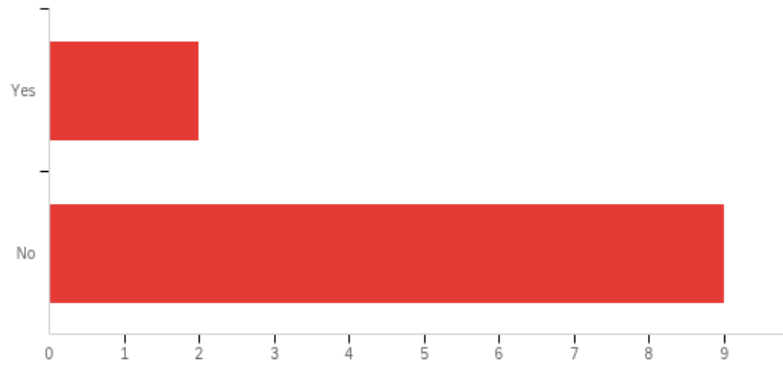


■ Yes ■ No

Q14 - Did you have to shut down your practice for any period of time?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Did you have to shut down your practice for any period of time?	1.00	2.00	1.82	0.39	0.15	11

#	Answer	%	Count
1	Yes	18.18%	2
2	No	81.82%	9
	Total	100%	11



Yes No

Q14a - If yes to question 14, for how long did your practice remain closed?

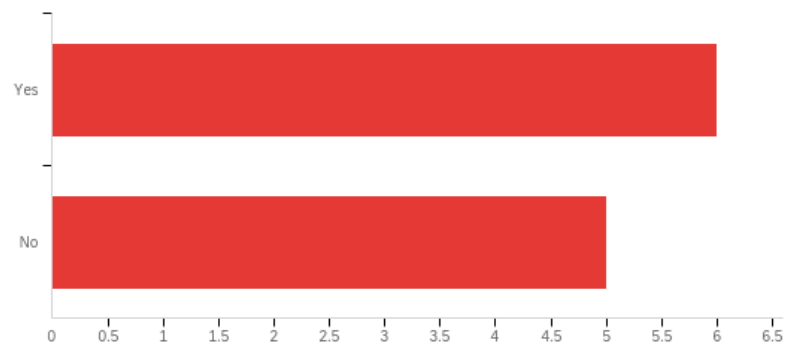
Permanent (1 of 3 locations)

3 days

Q15 - Was there an income shortage during the months of COVID?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Was there an income shortage during the months of COVID?	1.00	2.00	1.45	0.50	0.25	11

#	Answer	%	Count
1	Yes	54.55%	6
2	No	45.45%	5
	Total	100%	11

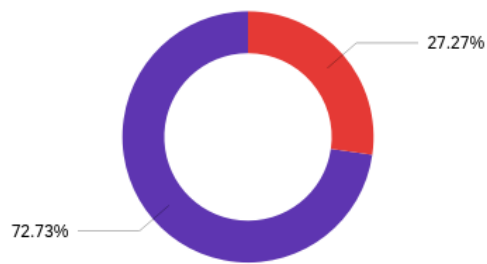
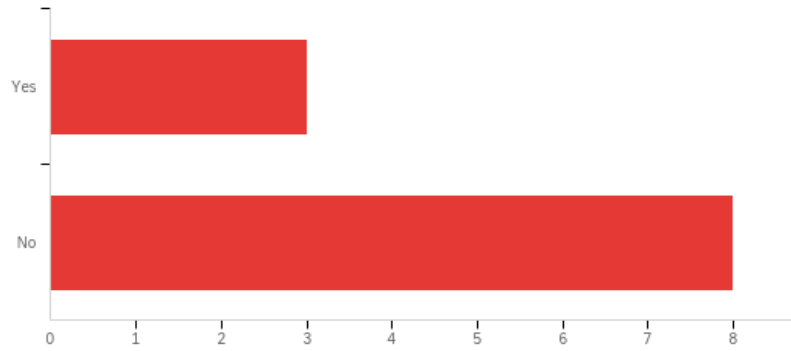


■ Yes
 ■ No

Q16 - Did you have to increase your prices of different services?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Did you have to increase your prices of different services?	1.00	2.00	1.73	0.45	0.20	11

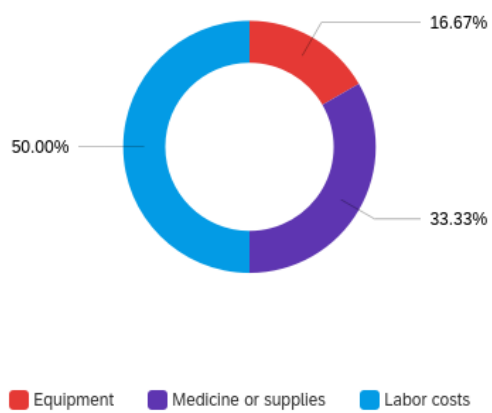
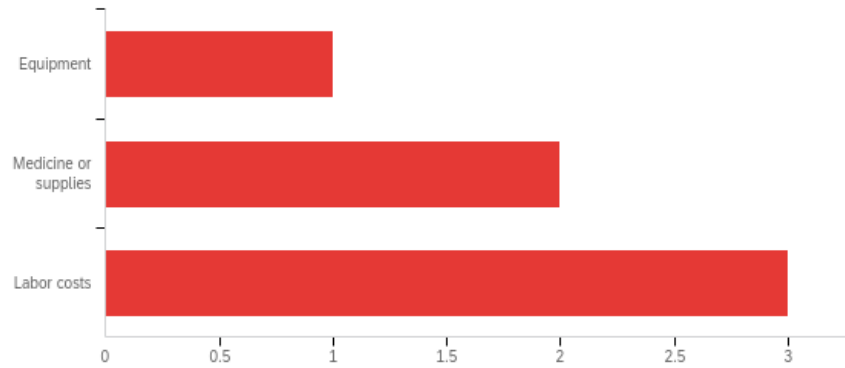
#	Answer	%	Count
1	Yes	27.27%	3
2	No	72.73%	8
	Total	100%	11



■ Yes
 ■ No

Q16a - If yes to question 16, was this cost increase reflective of a change in your base costs of ___? (select all that apply)

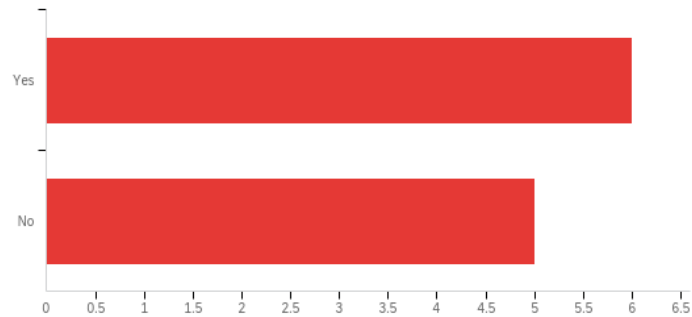
#	Answer	%	Count
1	Equipment	16.67%	1
2	Medicine or supplies	33.33%	2
3	Labor costs	50.00%	3
	Total	100%	6



Q17 - Did you maintain 6ft social distancing?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Did you maintain 6ft social distancing?	1.00	2.00	1.45	0.50	0.25	11

#	Answer	%	Count
1	Yes	54.55%	6
2	No	45.45%	5
	Total	100%	11



■ Yes ■ No

Q17a - If yes to question 17, what did you do to encourage or maintain that?

re-arranged desks, spaced out during lunch

Clients stay in their cars, only have closer contact with someone when restraining a pet for a procedure or exam.

not with staff, just clients. handoff protocols

discussed requirement with staff & clients

We put up dividers where we could, we assigned teams of 2 or 3 to rooms and reduced the amount of people that were allowed in common areas such as lunch room, etc.

Q17b - If no to question 17, did you take other precautions?

Inside with coworkers it was hard to maintain 6 feet distance. We wore masks all the time and limited our outside interactions even on days off

Yes

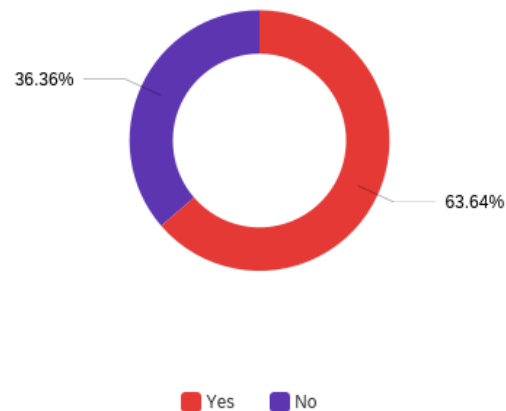
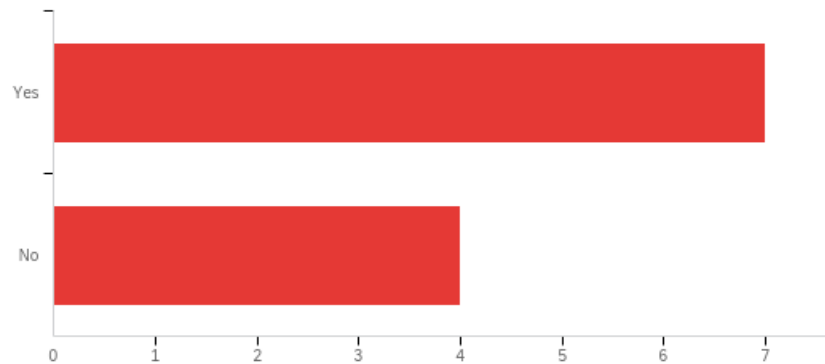
Wore masks and tried to maintain distance. In this field, it's difficult.

Masks and frequent hand washing.

Q18 - Did you ask your staff and clients to wear masks at all times?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Did you ask your staff and clients to wear masks at all times?	1.00	2.00	1.36	0.48	0.23	11

#	Answer	%	Count
1	Yes	63.64%	7
2	No	36.36%	4
	Total	100%	11



Q18a - If no to question 18, when did you enforce the masks?

When dealing with clients. Some staff wore masks inside all day but not all staff

If a 6 ft distance could not be maintained

When outside dealing with clients.

Q19 - What were your protocols if an employee came up sick?

Sent or stay home. If signs consistent with Covid a negative test was required to return to work

did not allow them in, made them get tested, quar. other employees that they were near for extended period of time

Follow Maine cdc guidelines

Stayed home until fever free for 3 days. No staff has had covid yet

testing required in order to return to work.

"carry on" as well as possible

They were to stay home.

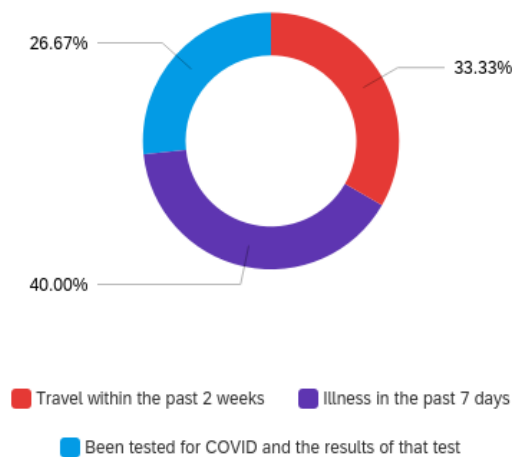
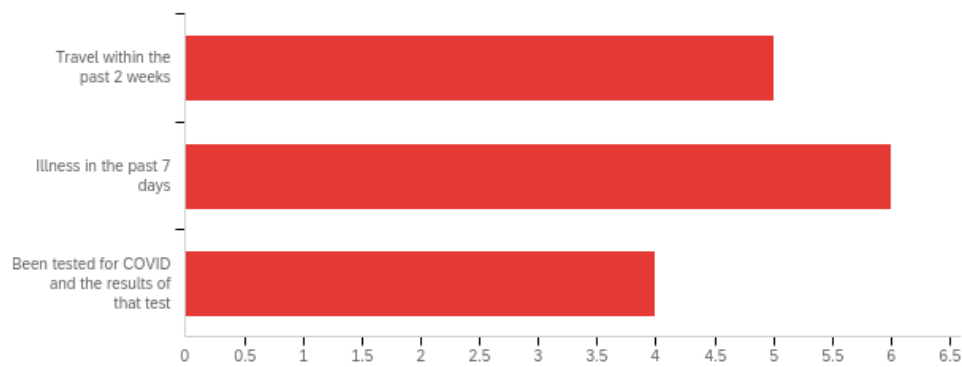
Must quarantine for 7 days and receive negative test on day 5

If an employee was sick they were not allowed in the building until they were 72 hours symptom free or a negative PCR test. This of course changed as the course of things changed. We are currently 24 hours outside of symptoms or the negative PCR test.

Don't come in, Call you doctor, hopefully for a Covid test

Q20 - Did you ask clients questions concerning ____ before their appointments? (select all that apply)

#	Answer	%	Count
1	Travel within the past 2 weeks	33.33%	5
2	Illness in the past 7 days	40.00%	6
3	Been tested for COVID and the results of that test	26.67%	4
	Total	100%	15



Q21 - What were your protocols if clients were sick, positive for COVID, or tested and pending results?

Reschedule appointment or have a friend bring pet in

reschedule

Follow Maine cdc guidelines

n/a - since we didn't allow them in, we didn't ask these questions

phone communication only, more intense handoff procedures, disinfectant on all cloth materials

The client, their family & pets were not allowed on the premises

They would have to reschedule their appt.

Appointment was cancelled or another person to bring pet to appt

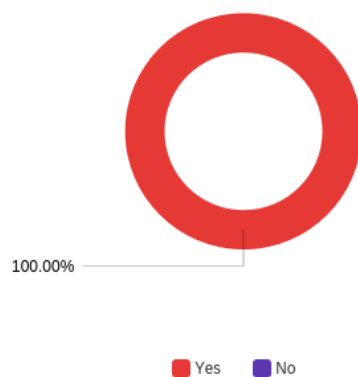
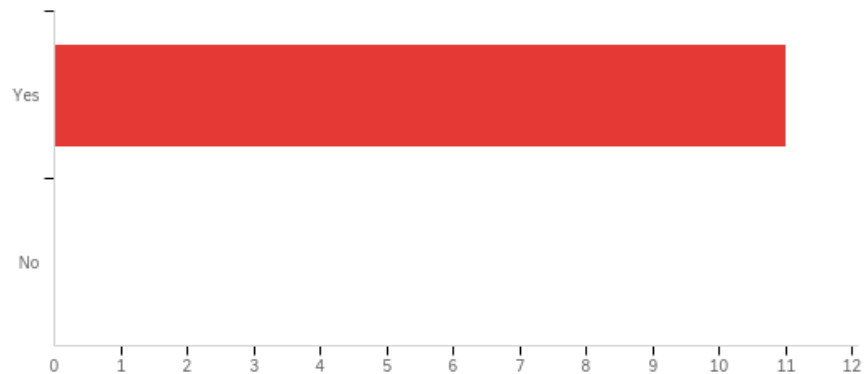
We rescheduled or asked that they have someone that has no been directly exposed to them drive their pet to the appointment.

Someone else (preferably not same household) brings in pet.

Q22 - Were you aware of the CDC guidelines?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Were you aware of the CDC guidelines?	1.00	1.00	1.00	0.00	0.00	11

#	Answer	%	Count
1	Yes	100.00%	11
2	No	0.00%	0
	Total	100%	11



Q22a - If yes to question 22, which aspects of those guidelines did you follow?

Masks at all times, frequent hand washing and disinfecting of hard surfaces. Ensuring proper airflow, changing air filters frequently. Limited high touch communal items. Portable HEPA systems. Posted signs in parking lot. Encouraged employees to stay home as needed.

the practice manager knew the specifics - not me specifically

All

We used the CDC guidelines for all of our cleaning procedures as well as employee quarantine after travel or illness

all required to best of our ability

maintain 6 ft distance between people

All guidelines

As many as we possibly could, our goal was to keep our team members as safe as possible.

Masks, social distancing as much as possible, hand washing, stay home if you're sick.

Q22b - If no to question 22, what were some things you did differently?
If no to question 22, what were some things you did differently?

Q23 - Which guidelines that you put into place worked best for you?

Masks. Air filters and systems. Frequent hand and surface cleaning

6 ft, mask, not letting the public in

All

Hard to say, we have managed quite well so far, so maybe all of them played a role

curbside, telephone communication

6 ft distancing

The mask wearing was probably the easiest thing to for us do. We had the supplies available immediately. Consistent oversight by our management team to ensure team members were wearing the masks, and wearing them appropriate was key.

Curbside.

Q24 - Which guidelines did not work well for you and will need future planning?

Distancing

n/a

None

Still trying to figure out how to best allow clients back in the building

obtaining client histories of Covid exposure

NA

I'm not sure that there was a specific guideline(s) that impacted us the most were the ones that limited our ability to perform the routine parts of our business for those who still wanted it. We are still dealing with the aftermath of being so far behind on wellness visits and reduced surgery schedules.

Curbside takes longer

AUTHOR'S BIOGRAPHY

I use to think of myself as just a small-town girl who lived in Peru, Maine. I attended Dirigo High School in Dixfield and Region 9 School of applied Technology in Mexico. I graduated in 2017 with high honors and I was in top five of my class. During my high school career, I became part of the National Honor Society and played many sports. I played soccer my freshman year and switched to field hockey for my sophomore, junior and senior year. I was on the basketball team my freshman, sophomore and the start of my junior year. Shortly after the start of winter sports my junior year, I switched from playing basketball to joining the wrestling team which I continued into my senior year. I also played softball all four years of high school.

Outside of high school and playing sports, I worked with animals. I live on a small family farm with my grandparents. We have many animals such as dogs, cats, rabbits, fish, goats, sheep, chickens, ducks, ginea hens, geese, pigs, cows, steers, a donkey and a horse. I have two pairs of steers which I train and work all summer long. I halter break my steers and teach them how to lead and also how to walk together in a yoke. After my steers are broke, I train them to pull weights. I train my steers and get them ready for the summer time so I can compete at Maine State Fairs and even some New Hampshire State Fairs. I compete at many fairs such as Ossipee Valley Fair, Topsham Fair, Cumberland Fair, Fryeburg Fair, Clinton Fair and many more all over the state.

After graduating high school, I started college at the University of Maine to major in Animal and Veterinary Sciences. I was also invited into the Honors College which I

decided to stick with all four years. After my first semester I decided to concentrate in Pre-Veterinary and add an Equine Studies minor. When I started College at the University of Maine, I joined a few clubs that got me involved in activities I had never done before. My freshman year I joined the Maine Animal Club which I participated in all 4 years. As part of the Maine Animal Club, I learned how to train and prep dairy cows and heifers for show. Something I had watched but never done before. I also participated in NESA, as part of Maine Animal Club, which is held every year to test student's knowledge in agriculture. Many schools compete against each other in a quiz bowl and also in judging livestock. When I joined the UMaine Standardbred Drill Team I started working with riding horses. I had been around pulling horses but had never rode horses before. After learning how to ride as part of the Drill Team, I bought my own riding horse that I could have at home.

Now that it is my senior year in college, I no longer see myself as just a small-town girl. I have almost completed my Bachelors in Science majoring in Animal and Veterinary Sciences with a concentration in Pre-Vet and an Equine Studies Minor. I have made Dean's list and will also be graduating Magna Cum Laude. I am finishing my honors thesis and graduating from the honors college as well. I have had many accomplishments during my time at the University of Maine and am proud of everything I have done, thus why I no longer see myself as *just* a small-town girl.

While preparing to graduate from UMaine I am also planning my future. I am currently getting ready to head off to graduate school where I will study veterinary medicine. I will be attending Long Island University College of Veterinary Medicine. I plan to study both large and small animals while at vet school. After I graduate and

become a Doctor of Veterinary Medicine, I plan to return to my home town and work as a traveling, large animal veterinarian.